



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
ENVIRONMENTAL
CLEANUP

MEMORANDUM

DATE: September 30, 2010

SUBJECT: Action Memorandum for the Jorgensen-Forge Outfall Site, Seattle, King County, Washington

FROM: Michael I. Sibley II, On-Scene Coordinator *MS*
Emergency Response Unit

THRU: Chris D. Field, Manager *CD*
Emergency Response Unit

THRU: Sheila Eckman, Manager
Site Cleanup Unit Three

TO: Daniel D. Opalski, Director
Office of Environmental Cleanup

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the selected time-critical removal action described herein for the Jorgensen Forge Outfall Site ("Site"), Seattle, King County, Washington. The proposed time-critical removal action is expected to be conducted by potentially responsible parties, The Boeing Company ("Boeing") and Jorgensen Forge Corporation, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") with oversight by the U.S. Environmental Protection Agency ("EPA").

This removal action consists of the cleaning and closure of existing 15- and 24-inch public lateral sewage discharge property line storm drain ("PLSD") pipes to remove and prevent polychlorinated biphenyls ("PCBs") and other hazardous substances from entering the Lower Duwamish Waterway ("LDW"). This removal action is intended to prevent continued discharge of stormwater through known PCB contamination to the LDW.

II. SITE CONDITIONS AND BACKGROUND

The CERCLIS ID is WAN0002329803 and the Site ID is 10JA.

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The Jorgensen Forge Outfall Site consists of two outfall pipes, a 24-inch and adjacent 15-inch, buried just south of the current Jorgensen Forge facility's northern boundary with the adjacent Boeing Plant 2 facility (Figures 1 and 2). Both pipes discharged into the LDW. The LDW was listed on the National Priority List ("NPL") in September 2001 (CERCLIS No. WA0002329803). In 2002, the Washington Department of Ecology ("Ecology") added the LDW to the Hazardous Site List under Facility Site identification No. 42927743. EPA and Ecology jointly issued an Administrative Order on Consent ("AOC") pursuant to CERCLA and the Model Toxics Control Act ("MTCA") for a remedial investigation and feasibility study ("RI/FS") for the LDW Site on December 21, 2000 to Respondents Boeing, City of Seattle, Port of Seattle and King County. EPA and Ecology also agreed for their mutual convenience in a Memorandum of Understanding that EPA will generally be the lead agency for in-water portions of the LDW Site and Ecology will generally be the lead agency for upland source control, and that the Agencies may alter these lead-support roles at any time for any portions of the LDW Site.

On January 18, 1994, EPA issued a Resource Conservation and Recovery Act (RCRA) Section 3008(h) AOC to Boeing for a RCRA facility investigation/corrective measures study ("RFI/CMS") for its Plant 2 facility, including the implementation of Interim measures EPA may select. A RCRA RFI/CMS is generally equivalent to a CERCLA RI/FS. Under the 1994 AOC Boeing will address contaminated LDW sediments adjacent to Plant 2.

In 2003, EPA issued a CERCLA removal AOC to Earle M. Jorgensen Company, former owner/operator of the current Jorgensen facility, for the development of an Engineering Evaluation/Cost Analysis for a non-time critical removal action for LDW sediments adjacent to the Jorgensen facility. This AOC has been implemented by EMJ and the current owner/operator of the facility, Jorgensen Forge Corporation, collectively "Jorgensen." Jorgensen and Boeing have agreed in an amendment to each of their respective EPA AOCs, to coordinate their efforts, particularly with regarding the transitional area or "transition zone" between their respective contaminated sediment actions. The pipes that are the subject of this Action Memorandum were and are a source to these contaminated sediments. Jorgensen is also implementing an Ecology source control MTCA AOC. These pipes are generally within the geographical area covered by that MTCA AOC, but have by agreement between EPA and Ecology been scheduled for time-critical removal action by EPA pursuant to this Action Memorandum.

Historically, stormwater discharges by King County and the City of Tukwila have also been through the 24-inch pipe. In November 2008, Ecology issued Notice of Violation (NOV) Number 6180 to King County and the City of Tukwila for discharging stormwater through known PCB contamination to the LDW. These parties have since agreed to re-route their stormwater for discharges by other means.

The approximately 24-inch PLSD historically serviced a large portion of the drainage basin in the proximity of the Jorgensen facility, including at least portions of the Jorgensen and Plant 2 facilities, East Marginal Way South within the City of Seattle and the City of Tukwila, and the King County International Airport ("KCIA"), also known as Boeing Field. The 24-inch PLSD was installed in the late 1930s or early 1940s. 2005 sediment data from the 24-inch PLSD pipe revealed concentrations of polychlorinated biphenyls ("PCBs") up to 10,000 milligrams per kilogram (mg/kg).

Site Conditions

The 24-inch PLSD flows from east to west approximately parallel to the property line and 10 feet from the Boeing Plant 2 facility. The storm drain is approximately 24 inches in diameter and 1,200 feet in length as measured from the catch basin on the west side of East Marginal Way South to the LDW outfall. There are five catch basins (manholes) within the 24-inch PLSD. Historical connections feeding into the 24-inch PLSD consisted of a 15-inch drain from Plant 2 that entered along the east end and a 12-inch drain that entered along the west end from Jorgensen. On the north side of the 24-inch PLSD within the Jorgensen facility is an inactive 15-inch PLSD (described as a 12-inch PLSD in some reports) that historically received flow from Plant 2 (Ecology 2007b). Figures 2 and 3 illustrate the locations of the PLSDs (tables and figures are at the back of this document).

The 24-inch PLSD is constructed of concrete with the exception of approximately the last 100 feet at the west (outfall) end, which is corrugated metal. A video survey in 2005 observed that the outfall area had collapsed; however, flow continues to discharge into the LDW. The concrete portion of the drain contained cracks and deterioration, particularly at the joints (Ecology 2007b).

Background

Jorgensen Facility

The Jorgensen facility consists of approximately 21.6 acres. Isaacson Iron Works developed the site between 1940 and 1942 for the fabrication of structural steel, tractor, and road equipment. Site operations included forging, heat-treating, and cutting prefabricated steel rods (Ecology 2007b).

An embayment along the LDW in the west central area of the facility was filled between 1942 and 1946 (EPA 2003). Bethlehem Steel operated a distribution center in the western portion of the facility between 1953 and 1963.

The facility operated by Earle M. Jorgensen Company from 1965 to 1992. In 1992, the operation was purchased by a plant management group which formed the Jorgensen Forge Corporation.

Currently, manufacturing operations consist of forging carbon and low-alloy steels, duplex stainless grades, aluminum alloys, titanium alloys, and nickel-base alloys for commercial aircraft, aerospace, oil exploration, power generation, automotive, and shipbuilding industries. (Ecology 2007b).

Investigations pursuant to the 2003 AOC sampled subsurface soil, shoreline sediment, debris piles, and catch basins for metals and PCBs. The only suspected Jorgensen source of PCBs on site was in transformers; however, no evidence of a release was identified. (Ecology 2007b). The facility currently maintains four private stormwater outfalls located in the central and southern areas of the facility under an NPDES permit (PBS 2008). Historically, there were nine stormwater outfalls. In the mid 1980s, outfalls 5 through 9, located along the northern half of the property shoreline, were plugged. Outfall 4 is used infrequently and has remained inactive for several years between events; therefore, it was not considered a likely source of contaminants released to the LDW. The sample results of effluent from outfalls 1 through 3 indicated metals (chromium, copper, and zinc) at concentrations elevated above state standards.

In 2004, sample results of two debris piles located along the southern half of the facility shoreline indicated elevated metals and PCB concentrations. The PCB concentration from the north and south piles, respectively, were 2.34 mg/kg and 2.06 mg/kg, above the lowest apparent threshold of 0.13 mg/kg. Sampling of four of 19 catch basins detected 0.129 to 0.302 mg/kg PCBs. Due to the detection of contamination and accumulation of sediments in the storm drains, the catch basins were cleaned out following the sampling event (Farallon and Anchor 2006). Follow-up sampling of the catch basins in 2005 did not recover a sufficient quantity of storm solids for analysis; therefore, no sampling was conducted. It was concluded that implementation of best management practices (cleaning the catch basins) was effective and that storm solids observed during the sampling in 2004 had accumulated over several years.

In December 2009, Jorgensen completed a Draft Source Control Evaluation (SCER) Addendum Report. The purpose of the study was to fill data gaps identified by Ecology in the SCER report. The study included additional sampling of groundwater, soil, and storm drain solids analyzed for metals, total petroleum hydrocarbon ("TPH"), semivolatile organic compounds ("SVOCs"), volatile organic compounds ("VOCs"), as well as a video survey of storm drains (other than the PLSDs covered by this Memorandum). Only one monitoring well (MW6) located in the southwest area of the property was analyzed for PCBs to confirm 2003 sample results. PCB groundwater results were not detected above the laboratory practical quantitation limit of 0.000049 mg/kg. The video survey included outfalls 1 through 3 and historical drains leading to outfall 4 or 5. No connection was established between the surveyed drain and the Jorgensen 12-inch feeder line that connects to the 24-inch PLSD (Anchor 2009).

Boeing Plant 2

The Plant 2 facility has operated north of the Jorgensen facility since the 1930s, specializing in manufacturing aluminum alloy, steel alloy, and titanium alloy airplane parts. The facility encompasses approximately 109 acres. Currently, Plant 2 is shifting toward research and administration; however, historically, hazardous substances or constituents used or found on site included metals, PCBs, VOCs/SVOCs, TPH, and polycyclic aromatic hydrocarbons ("PAHs"). Corrective action under the 1994 RCRA 3008(h) AOC is ongoing to assess and correct releases of hazardous constituents detected in all media. Of eight administratively divided corrective action areas, two upland areas, area 2-66 and the South Yard Area, and the sediment area (Duwamish Sediment Other Area or "DSOA") border the Jorgensen facility; (Ecology 2007b).

Area 2-66

Area 2-66 includes 10 RCRA units; A Phase I investigation of the transformer pad analyzed 180 soil samples from 22 of 28 borings. The maximum PCB concentration detected was 660 mg/kg (sample SB-07221) from a depth of 6.5 to 8.0 feet bgs at a location between the transformer pad and the Boeing-Jorgensen property line. This sample depth is below the depth of the Boeing 15-inch PLSD that parallels the 24-inch PLSD. The step-out sample (SB-07220) results indicated PCBs at 0.22 mg/kg within 0 to 2 feet bgs and 0.132 mg/kg from a location 8 to 10 feet bgs less than 20 feet south of the 24-inch PLSD. TPH results indicated most samples were a mixture of a petroleum solvent and heavy oil. The area of PCB contamination extended below the depth of the 24-inch PLSD and south into the Jorgensen facility. Sample results at Plant 2 outfall 9 immediately north of the property line indicated migration of PCB contamination along the pipeline into the LDW. Migration of PCB contamination along the 24-inch PLSD line was neither eliminated nor definitively found a completed pathway because there were known connections (pipelines) between the transformer area and the 24-inch PLSD (Floyd Snider 2004). In spring 2004, four Seattle City Light transformers were removed from the Phase I study source area.

A Phase II study to fill data gaps in the Phase I study was completed in August 2005. It analyzed for PCBs and TPH in 96 subsurface soil, 8 groundwater, and 13 sediment samples from manholes in the stormwater systems, and determined that 1) the extent of PCB soil contamination decreased laterally with borings more than 80 feet; 2) PCBs were not detected at concentrations greater than 1 mg/kg (Floyd Snider 2005); and 3) PCB contamination from the transformer source area was entering the LDW along Plant 2 historical outfall 9 and its replacement 9A/Line Z. However, PCBs from the transformer area were not entering the 24-inch PLSD through either direct connections or subsurface cracks, so PCBs detected within the pipe were presumed from other sources (Floyd Snider 2005a).

The Phase II study also included sediment samples from the five storm drain manholes within the 24-inch PLSD and the two manholes within the inactive Boeing 15-inch PLSD. The most down-gradient storm drain manhole ("SDMH"-24A) within the 24-inch PLSD is approximately 100 feet up-gradient of the transformer pad. An inactive and plugged 12-inch feeder line originating from the Jorgensen facility is approximately 20 feet up-gradient of SDMH-24A. The most down-gradient manhole (SDMH-15A) within the 15-inch stormwater line is located approximately half the distance between SDMH-24A and the transformer pad (Floyd Snider 2005a). Total PCB results for samples collected from the 24-inch and 15-inch PLSDs (including lateral connections) are summarized in Table 1.

South Yard Area/Storm Drains

The South Yard area consists of approximately 13 acres and 18 RCRA units, of which 12 are stormwater management units. The soil and groundwater contaminants of concern (COCs) are VOCs, SVOCs, PCBs, and metals. Diesel hydrocarbons are a groundwater COC. PCB Aroclors 1254 and 1260 are COCs in soil; only 1260 is a groundwater COC. Groundwater flow direction along the Boeing-Jorgensen boundary is approximately parallel or slightly towards Jorgensen (Ecology 2007b). 24 stormwater outfalls drain roof and pavement runoff to the LDW. Tidal fluctuations partially or entirely inundate these drains. Historically, a portion of the South Yard drained to the 24-inch PLSD through a 15-inch feeder line (at location No. 37-7/SDMH11). Other portions drained to the Boeing 15-inch PLSD at SDMH15-B, and to the outfall 9/Z-line (Ecology 2007b, Anchor 2010).

A 2005 storm drain survey found up to 2.6 mg/kg total PCBs in the X line and 0.134 mg/kg in the Y line in addition to elevated concentrations of lead, chromium, and mercury (Floyd Snider 2005b) after which the X and Y lines were sealed with stormwater rerouted to the Z line. Subsequent sampling to determine the source of PCBs to the storm drains detected up to 40.5 mg/kg in floor caulking and sealants in building slabs and roadways within the drainage basin (Ecology 2007b).

The sealing of the Boeing 15-inch feeder line to the 24-inch PLSD is assumed to have occurred during the 2005–2006 storm line interim measure. This will be confirmed during this removal action.

City of Tukwila

In 1996, the City of Tukwila installed a stormwater collection system along East Marginal Way South to address street flooding. A total of 48 catch basins were installed along both sides of East Marginal Way South which discharged into an existing stormwater line which discharged to the 24-inch PLSD (PBS 2008).

In November 2008, Ecology issued a NOV to King County and the City of Tukwila for discharging stormwater through known PCB contamination to the LDW. At that time, the two governmental entities were the primary parties discharging through the 24-inch PLSD. The salient points in the responses of these local governments were that; 1) they had no control of pipes on private land, specifically no obligation to enforce against private pipe owners, especially in the absence of any current illicit discharge; 2) there is no evidence the governments discharged PCBs, the releases in issue occurred historically and remain in surrounding soil; 3) they have a legal right to discharge to a natural watercourse, including via piped drains; and 4) private property owners should be responsible for addressing their contaminating infrastructure, not local governments with public funds. The following month Tukwila initiated a PCB source control investigation of its stormwater system.

King County

Basin 5 of KCIA (Boeing Field), approximately 10.5 acres, discharges to the City of Tukwila stormwater system and into the 24-inch PLSD (Ecology 2007b). In January 2009, the County submitted a Basin 5 source control report for Ecology summarizing stormwater data for the years 1997-8, 2000-1, 2005, and 2008 (King 2009a). PCB concentrations are generally less than 50 mg/kg with one exception. See the preceding City of Tukwila section above.

Previous investigations of North Boeing Field ("NBF"), north and up-gradient of Basin 5, found high PCB concentrations up to 79,000 mg/kg (Landau 2007) believed to be from runway joint caulk. Materials that were identified at the time with PCB concentrations above 50 mg/kg were subsequently removed and replaced. NBF drains to Slip 4 (north of Plant 2). NBF and Slip 4 are being addressed by various EPA and Ecology AOCs.

In December 2009, King County completed stormwater system modifications to divert flow from Basin 5 to its Basin 2 outfall which is routed to a pump station and a series of tide gates and valves to prevent backflow from the LDW from entering the system. These modifications included plugging the outflow to the City of Tukwila stormwater system at manhole MH-1-E (catch basin CB584) and constructing a new manhole on the east side of Basin 5 to connect to the Basin 2 system (URS 2010).

A. Site Description

1. Removal site evaluation

PCB contamination in the 24-inch PLSD is due to historical releases. The Site is a very small portion of the LDW Superfund as noted above. No previous removal actions have involved the pipes that are the subject of this Action Memorandum.

The drainage basin for the 24-inch PLSD included a portion of Jorgensen and Plant 2 facilities, East Marginal Way South within the City of Seattle and the City of Tukwila, and the KCIA. Currently all historical drainage areas have been diverted elsewhere, except for approximately three acres of the adjacent street, East Marginal Way South within the City of Tukwila.

Several studies and remediation activities within the drainage basin for the 24-inch PLSD have been conducted since at least the early 1990s. The Jorgensen Forge and Boeing Plant 2 facilities have EPA identification numbers WAD000602813 and WAD009256819, respectively. Potential upgradient sources of contamination include EAA-4 include KCIA/Boeing and East Marginal Way South. Studies within the Plant 2 and Jorgensen facilities have detected contaminants in the sediment, soil, and groundwater with elevated PCB, TPH, VOC, SVOCs, or metals. In 2005 the 24-inch PLSD was sampled for PCB Aroclors and TPH. Previous studies have indicated elevated PCBs detected in LDW bank sediment adjacent to the Plant 2 and Jorgensen facilities. Upgradient PCB contamination has been detected in the caulking material within Plant 2 and KCIA and in storm drains within the Plant 2 and Jorgensen facilities; however, the highest concentrations appear to be located within the transformer release area along the Boeing-Jorgensen boundary.

2. Physical location

The Site is located along the northern boundary of the adjacent Jorgensen and Plant 2 facilities. The street address is 8531 East Marginal Way South, Seattle, Washington, 98108. The approximate location of the east end of the 24-inch PLSD is 47° 31'37.82" North Latitude; 122° 18'13.59" West Longitude (Figure 1).

The Site and surrounding area are primarily industrial. The nearest school (Concord Elementary) is approximately 0.75 miles west-southwest. The closest residences are within a mile are to the west in the South Park neighborhood across the LDW.

Annual meteorological averages at the Seattle-Tacoma Airport from 1931 to 2005 were: precipitation, 38.09 inches; temperature, 44.2–59.3° Fahrenheit (average minimum to average maximum); snowfall, 11.8 inches.

There are no known threatened or endangered species on the Site, nor are there any potential historical landmarks and/or structures with historical significance at the Site.

3. Site Characteristics

The Jorgensen facility maintains active manufacturing operations including forging carbon and low-alloy steels, duplex stainless grades, aluminum alloys, titanium

alloys, and nickel-base alloys for commercial aircraft, aerospace, oil exploration, power generation, automotive, and shipbuilding industries.

Boeing Plant 2 is also an active aircraft parts manufacturing, however it is currently, shifting toward research and administration. Historically, hazardous substances or constituents used on site included metals, PCBs, TPH, VOCs/SVOCs and PAHs.

4. Release or threatened release into the environment of a hazardous substance, or pollutant or contaminant

PCBs, the contaminant of concern, are hazardous substances as defined by section 101(14) of CERCLA, as amended, 42 U.S.C. section 9601(14). As discussed above, other hazardous substances, pollutants, or contaminants may also be on-site.

Numerous environmental investigations have documented the presence of PCBs in the PLSD pipes which discharge to the LDW. Total PCBs have been detected at concentrations as high as 10,000 mg/kg in a sample collected from the 24-inch PLSD. As indicated by the results in the Table 1, multiple samples exceed both the MTCA cleanup level for industrial soil (10 mg/kg) and EPA Regional Screening Levels for industrial soil and the protection of groundwater (0.74 and 0.0088 mg/kg, respectively, for Aroclor 1254). The locations of samples listed in Table 1 are indicated on Figure 3.

5. NPL Status

The Jorgensen-Forge Outfall Site is within the LDW Superfund Site which was listed on the National Priorities List (NPL) on 13 September 2001.

6. Maps, figures, and other graphic representations

Refer to attached Figures 1, 2, and 3 for the site location, layout, and an illustration of representative sample locations.

B. Other Actions to Date

1. Previous Actions

There have been no previous or currently ongoing response actions with respect to the pipes that are the subject of this Action Memorandum. All relevant previous or current response actions at surrounding facilities, including the Plant 2 and Jorgensen facilities, have been described above.

2. Current Actions

There are no government or private activities that are currently being performed at the Site.

C. State and Local Authorities' Roles

1. State and Local Actions to Date

Ecology requested that EPA assist in the cleanup of the 24-inch line (Boeing proposed efficiently addressing the 15-inch line simultaneously). No first responder activities have occurred related to the 24-inch or 15-inch PLSD. EPA is the lead agency for this removal action, with support from Ecology. The EPA and Ecology joint lead and division of responsibilities for the LDW Site is fully described above.

2. Potential for continued State/Local Response

The continued administrative and regulatory support of state and local agencies is anticipated for this action. No state or local response action for these PLSD pipes is anticipated.

D. Tribal Interests

For the LDW Site, (including all early action and source control actions) within the LDW, EPA has initiated formal consultation with the Muckleshoot and Suquamish Tribes. Tribes have participated in document reviews, special meetings upon Tribal request, and frequent coordination meetings such as quarterly updates and project-specific briefings.

For this removal action, EPA has provided information to the Tribes at LDW quarterly meetings and has asked the Tribes if they have any concerns about the proposed removal action. Most recently, on August 17, 2010, EPA provided a project update to the Muckleshoot Tribe and Suquamish Tribe and neither Tribe expressed any environmental or cultural resource concerns related to the removal action for EPA to consider.

III. THREATS TO PUBLIC HEALTH WELFARE OR ENVIRONMENT

The current conditions at this Site meet the following factors which indicate that the Site is a threat to the public health or welfare or the environment, and a removal action is appropriate under § 300.415(b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

A. Threat to Public Health or Welfare

1. Actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances or pollutants or contaminants [300.415(b)(2)(i)].

The elevated concentrations of PCBs found in solids and stormwater discharged from the PLSD pipes into the LDW pose a threat to human health and the environment. Stormwater and solids discharging from the PLSD pipes to the LDW contain PCB concentrations that exceed promulgated water quality and sediment criteria.

Human Health

After discharge to the LDW, PCBs are deposited on and in sediments in the LDW. Potential exposure pathways for human health risks include direct contact with PCB-contaminated sediments and ingestion of contaminated fish or shellfish. PCBs are a human carcinogen known to accumulate in the tissue of fish and shellfish. PCBs found in Plant 2 and Jorgensen sediments contribute to unacceptable risks to people throughout the LDW, as set forth in the LDW RI/FS.

Environment

Ecological receptors such as benthic organisms, fish, bird, and mammals may be exposed to PCBs through direct contact and/or incidental ingestion of PCB-contaminated sediments. The primary potential exposure pathway for fish, birds, and mammals is ingestion of marine organisms. Bottomfish may have additional exposure due to direct contact with or ingestion of contaminated sediment. PCBs are known to adversely affect aquatic biota. Sediments in the LDW have concentrations of PCBs that exceed Washington State Sediment Management Standards (SMS) numerical criteria for the protection of benthic invertebrate organisms.

2. Actual or potential contamination of drinking water supplies or sensitive ecosystems [300.415(b)(2)(ii)].

The LDW is a sensitive estuarian ecosystem in which salmonids listed as endangered species live as juveniles, along with the full complement of wildlife typical of such systems in urban areas of the Pacific Northwest. Discharges from the PLSD pipes are a source of contamination to the LDW.

3. Weather conditions that may cause hazardous substances or pollutants to migrate or to be released [300.415(b)(2)(v)].

PCBs may migrate from the 24-inch PLSD during precipitation events. Tidal fluctuations that move up into and out of the 24-inch PLSD may continue to cause contaminants to migrate to or from the LDW.

4. The availability of other appropriate federal or state response mechanisms to respond to the release [300.415(b)(2)(vii)].

The proposed time-critical removal action is expected to be conducted by potentially responsible parties pursuant to an EPA Order pursuant to section 106 of CERCLA. There are no known other appropriate federal or state response mechanisms capable of providing the appropriate resources in the prompt manner needed to address the potential human health and ecological risks associated with the PLSD pipes described herein.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

Based on the analysis of the nature and extent of Site contamination, the following time-critical removal action is proposed to address the public health, welfare, and the environmental threats discussed in Section III of this Action Memorandum.

A. Proposed Actions

1. Proposed Action Description

The proposed removal action will eliminate stormwater discharges from the PLSD 15- and 24-inch pipelines (hereinafter collectively referred to as the "Pipelines") to the LDW. It is anticipated that the proposed removal action shall be conducted in accordance with EPA-approved work plans and design documents.

For purposes of this removal action, EPA considered the following alternatives for the 24-inch pipe (the 15-inch pipe would be removed in any case):

1. Clean, close, and seal the pipe in place with ash-fill or other inert material, and re-route the stormwater to another outflow location off site;
2. Clean and repair the pipe in situ; or
3. Excavate the pipe and install a new line at the same location.

The City of Tukwila is currently the only known entity actively using the 24-inch PLSD for stormwater discharge (only 3% of its stormwater). The first option requires the city to redirect its stormwater discharge to another outfall location and the city has agreed to do so.

The nearest down-gradient location is a 48-inch outfall through the Boeing (formerly Isaacson Iron Works) property south of the Jorgensen facility. The 48-inch drain crosses East Marginal Way South approximately 1,000 feet south of the 24-inch PLSD. The estimated cost to clean and fill/close the 24-inch PLSD in place is \$50,000 to \$80,000.

The second option of cleaning and repairing the 24-inch PLSD in situ would allow the existing stormwater flow to continue in its current route with limited disruption to surface facility operations. In situ repairs may be completed by a trenchless technology that includes (1) assessing the current condition of the pipe with a video survey, (2) cleaning the pipe with a sewer jet, and (3) re-lining the pipe with a material that forms in place and seals the existing pipe.

This option would require vacuum trucks to remove material (roots, sediment, and/or water) from the pipe during the cleaning process which may contain contaminants that require special handling and disposal, and repairing the collapsed outfall area prior to re-lining the pipe to eliminate infiltration of potential contaminants in the soil or groundwater surrounding the collapsed area. Lastly, a trap at the outfall may be necessary to eliminate or reduce inflow of tidal water and suspended sediment which may contain contaminants from the LDW. Total costs are estimated at \$200,000 to \$220,000.

The third option would excavate the 24-inch PLSD and replace it with a new stormwater pipe. Soil surrounding the pipes would be replaced with clean fill. The estimated cost is \$800,000 to \$1,000,000.

Given that the City of Tukwila will divert its stormwater from the 24-inch PLSD, the two significantly more expensive but no more protective alternatives may be eliminated.

The proposed removal action consists primarily of locating the underground PLSD pipes, removing the overburden to expose them and accessible lateral connections, flushing the pipes to remove any residual water and solids contained within the lines, and *in situ* sealing and closure of the pipes.

The proposed work activities will be conducted within the Boeing 15-inch and directly adjacent 24-inch pipes that transit the northern portion of the Jorgensen facility. The work will be limited to the concrete portion of the pipes which extend from the upgradient Jorgensen eastern property line to the downgradient intersection of the concrete-corrugated metal pipe ("CMP") connections in the pipes near the Jorgensen western property line.

The work area will be enclosed by temporary fencing, and advisories will be placed on the fencing to alert and educate people about the cleanup activity.

Prior to opening an excavation, the PLSD 15- and 24-inch pipes will be located to identify any underground installations that may reasonably be expected to be encountered during the excavation work. Additionally, all surface encumbrances that are located so as to create a hazard to employees will be identified and removed, as appropriate.

Material overlying the buried pipes will be excavated and set aside to be reused as backfill and will be placed to avoid contamination of clean surfaces. The pipes and accessible laterals will be cleaned out, and this activity will be conducted to ensure any wash water and/or residual solids are contained thus avoiding an uncontrolled release to the environment. A reconnaissance will be conducted to ensure that water and residual solids have been removed from within the cleaned portions of the pipes. The pipes will be permanently sealed and then reburied. .

All wastes, including wastewater and pipe residuals, will be analyzed to determine the appropriate packaging, labeling, transportation, and disposal. Best Management Practices ("BMPs") will be implemented during construction to protect workers, the community, and the environment from short-term construction impacts such as erosion, sedimentation, fugitive dust, and other similar potential impacts. Ecology will be responsible for post-removal site controls.

2. Contribution to remedial performance

The proposed action will, to the extent practicable, contribute to the efficient performance of any long-term remedial action for the LDW.

3. Applicable or relevant and appropriate requirements (ARARs)

The NCP requires that removal actions attain Applicable or Relevant and Appropriate Requirements (ARARs) under federal or more stringent state environment or facility siting laws, to the extent practicable. (40 CFR § 300.415[j]) In determining whether compliance with ARARs is practicable, EPA may consider the scope of the removal action and the urgency of the situation. (40 CFR § 300.415[j]) The scope of the removal action proposed in this Action Memorandum is limited.

Toxic Substances Control Act (TSCA) Regulations [40 CFR 761]. These regulations are applicable to solids in the storm drain system and stormwater that contain PCBs. All solids with PCBs at a concentration equal to or greater than 50 ppm must be incinerated in an approved incinerator or disposed of in a State or federally authorized hazardous or dangerous waste landfill, and those solids with PCBs of a concentration less than 50 ppm may be disposed in a municipal solid waste or non-hazardous waste landfill.

Washington State Hazardous Waste Management Act and Dangerous Waste Regulations [RCW 70.105; Chapter 173-303 WAC]. These regulations govern the handling and disposition of dangerous waste, including identification, accumulation, storage, transport, treatment, and disposal. They are potentially applicable to generating, handling, and managing dangerous waste at the Site, and would be potentially relevant and appropriate even if dangerous wastes are not managed during remediation.

Washington State Solid Waste Handling Standards [RCW 70.95; Chapter 173-350 WAC]. These standards apply to facilities and activities that manage solid waste. The regulations set minimum functional performance standards for proper handling and disposal of solid waste; describe responsibilities of various entities; and stipulate requirements for solid waste handling facility location, design, construction, operation, and closure. These regulation are also potentially applicable or relevant and appropriate for management of excavated soil or debris that will be generated during the Site cleanup.

Washington Clean Air Act and Implementing Regulations [WAC 173-400-040(8)]. This regulation is potentially relevant and appropriate to response actions at the Site. It requires the owner or operator of a source of fugitive dust to take reasonable precautions to prevent fugitive dust from becoming airborne and to maintain and operate the source to minimize emissions.

General Regulations for Air Pollution Sources - Washington State [RCW 70.94; Chapter 173-400 WAC]. These regulations establish standards and rules applicable to the control and/or prevention of the emission of air contaminants. Depending on the response action selected, these regulations are potentially applicable to the Site (e.g., generation of fugitive dust during soil excavation).

4. Project Schedule

The project is expected to take one week to complete. It is presently anticipated that this work will be performed by potentially responsible parties with EPA oversight during the 2010 construction season.

B. Estimated Costs

The estimated oversight costs for removal action are \pm \$50,000. EPA estimated costs per this Action memorandum are anticipated only for costs associated work performed by responsible parties based in significant part on discussions with such parties. If EPA were to undertake implementation of the work described in this Action Memorandum, with its own resources, an Action Memorandum Amendment and cost Ceiling Increase would likely be required.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If the proposed removal action should be delayed or not taken, hazardous substances will remain as potential human health and ecological threats as a continuing source of contaminants to the LDW. Remediation of contaminated sediment in affected areas of the LDW could not proceed.

VII. OUTSTANDING POLICY ISSUES

None.

VIII. ENFORCEMENT

See the attached "Confidential Enforcement Addendum" for enforcement details.

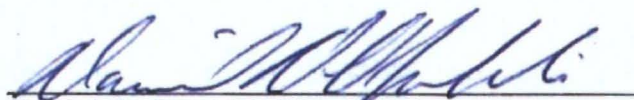
IX. RECOMMENDATION

This decision document represents the selected removal action for the Jorgensen-Forge Outfall Site, developed in accordance with CERCLA as amended, and is consistent with the NCP. This decision is based on the administrative record for the Site.

Conditions at this Site meet the NCP section 300.415(b)(2) criteria for a removal action and I recommend your approval of the proposed removal action.

X. APPROVAL / DISAPPROVAL

X Approval



Daniel D. Opalski, Director
Office of Environmental Cleanup

9/30/2010
Date

_____ Disapproval

Daniel D. Opalski, Director
Office of Environmental Cleanup

Date

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Jorgensen Forge/Boeing Action Memo

Data Table

Table 1: Summary of Total PCB Results for 24-Inch and 15-inch PLSDs

Sample Locations	Sample Date	Results (mg/kg)				
		Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCBs
MTCA Cleanup Level for Industrial Soil (Total PCBs)	--	--	--	--	--	10
Regional Screening Levels for Industrial Soil	--	0.74	0.74	0.74	0.74	--
Soil Screening Level for Protection of Groundwater	--	0.0053	0.0052	0.0088	0.024	--
24-inch PLSD Sample Results East to West						
SD MH11(SD006)	6/3/2005	0.96 U	0.96 U	68	0.96 U	68
No.37-2, SDMH11 (SD001)	6/3/2005	256 U	770 U	2,600	256 U	2,600
No. 37-7, SDMH11 (SD002) (Boeing 15-inch feeder pipe)	5/3/2005	86.2 U	86.2 U	730	86.2 U	730
SD MH24B (SD004)	5/3/2005	323 U	323 U	2,400	323 U	2,400
SD MH24A (SD005)	5/3/2005	1,400 U	1,400 U	10,000	1,400 U	10,000
Boeing 15-inch PLSD East to West						
SD MH 15B (SD003)	5/3/2005	16.7 U	16.7 U	140	16.7 U	140
SD MH 15A (CB010 Composite)	4/8/2005	8 U	39	40	8 U	79
SD MH 15A (CB011 Top 9")	4/8/2005	0.64 U	3.4	3.0	0.8	7.2
SD MH 15A (CB012 Bottom 3")	4/8/2005	24 U	120	230	47 UY	350
Jorgensen Forge 12-inch Feeder Pipe						
12SD-070105-01 (at tie-in)	7/1/2005	1.6 U	1.6 U	1,100	1.6 U	1,100
12SD-070105-02 (40 feet up from tie-in)	7/1/2005	1.6 U	1.6 U	6.5	1.6 U	6.5

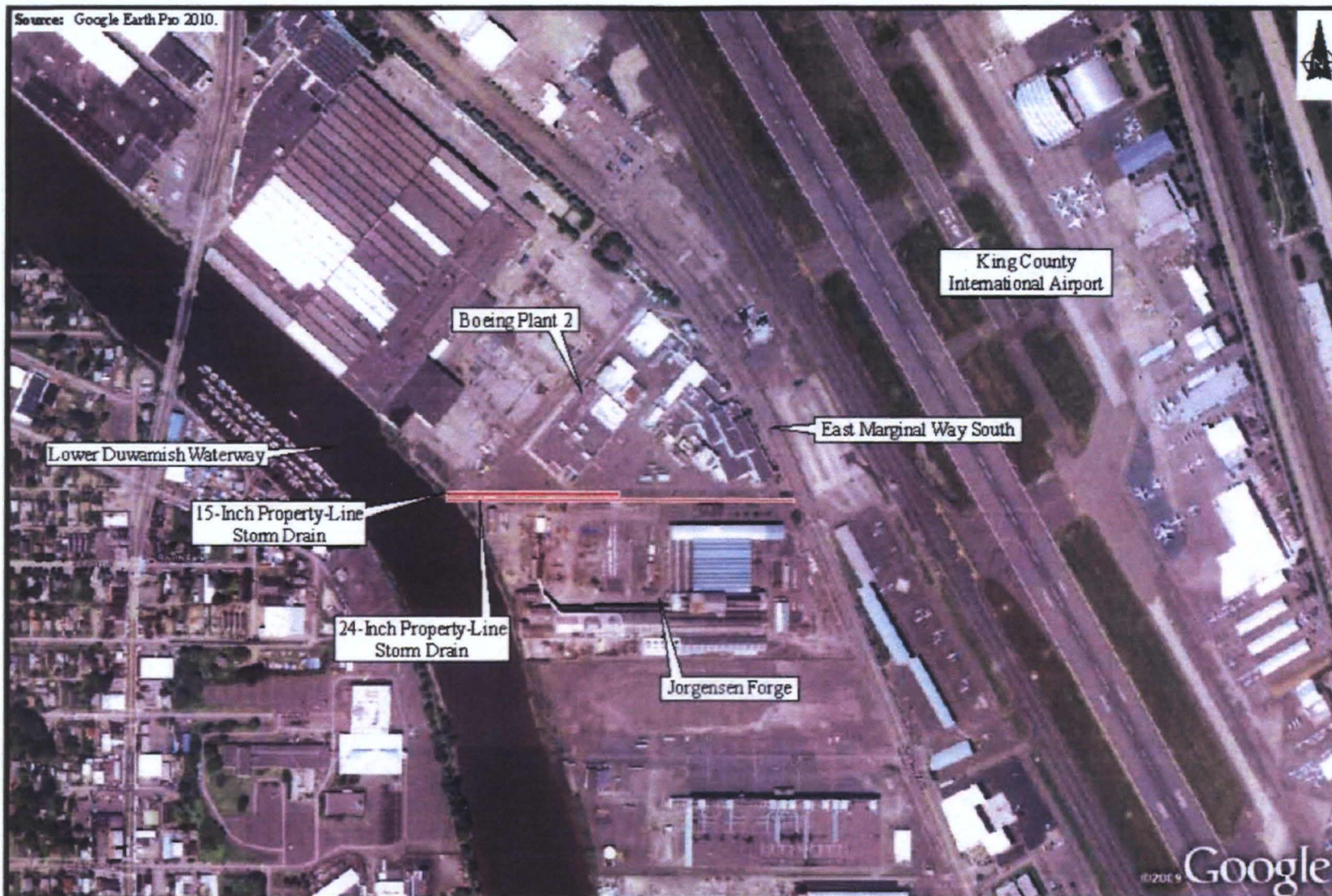
Source: Floyd Snider 2005a; Farallon and Anchor 2006

Key:

- = not available / not applicable
- mg/kg = milligrams per kilogram
- MTCA = Washington State Department of Ecology Model Toxics Control Act
- PCBs = polychlorinated biphenyls
- PLSD = property line storm drain
- U = no detected concentration above the listed laboratory reporting limit
- Y = Analyte reporting limit is raised due to a positive chromatographic interference;
the compound is not detected above the raised limit but may be present at or below the limit.

Jorgensen Forge/Boeing Action Memo

Figures





 ecology and environment, inc. International Specialists in the Environment Seattle, Washington	JORGENSEN-FORGE OUTFALL SITE Seattle, Washington	Figure 2 SITE LAYOUT MAP		
	 Approximate Scale in Feet	Date 8/31/10	Drawn by: AES	10: START-3\10070003\fig 2



Figure 3
GE SELECT SAMPLE LOC

10:START-3\10070003\fig 3

CONFIDENTIAL ENFORCEMENT ADDENDUM

Removal Action at Jorgensen Forge/Boeing Site

PRP Search

In an effort to initiate and complete the removal action in an expeditious manner and with the least amount of cost to EPA, an Administrative Order of Consent has been prepared for issuance to the parties who owned and/or used the 24" Storm water Line at the Jorgensen-Forge Site ("Site"). These parties include Jorgensen-Forge & Boeing Company.

There is extensive data which indicates that Boeing from historical practices, transformer spills contributed to the high PCB levels found in the 24" Storm drain line. Until recently Boeing had a direct connection to the 24" line, which has been plugged.

There is small amounts of data indicating possible contribution to the 24" line from a 6" line connection from the Jorgensen-Forge property.

Notification of PRPs of Potential Liability and of the Required Removal Action

Jorgensen-Forge has been notified by WDOE Order & EPA of the requirement for removal action of the 24" line via negotiation meetings and AM and AOC.

Decision Whether to Issue an Order

EPA intends to issue an Administrative Order on Consent (AOC) requiring the PRPs to implement the selected removal action.

Strategic concerns regarding the issuance of the order is to ensure that the PRP(s) will conduct the removal action.

Jorgensen-Forge has not adequately responded to WDOE toxic cleanup order. This resulted in the state requesting EPA assistance with the cleanup.

Negotiation and Order Issuance Strategy

Jorgensen-Forge/Boeing have submitted a statement of work (SOW) and a work plan to the EPA, in anticipation of an AOC.

Response & negotiation turn around to the AOC should be no longer than 5-7 days. All parties are aware of the AOC & the removal work required.

OSC has pre-negotiated portions of work cost share has been set at 80/20 Boeing/Jorgensen-Forge for the 24" line. Both companies are aware of this cost share proposal, but it has not yet been officially approved.

- (Admins Record Input)

① PolRep 104(A) to 104(B) (perennial report) (Sequence of events)

- Want authority report concerning Authority Policy (not 104(B) Activities)
Due to STMTS Turn over & weather

② Two phase closure Report to Home Closure & Turn over to RCRA
Approx - July

DO.

(Shown - to check if it is in the order)